

REMARKS

In the Office Action mailed November 2, 2004, claims 1-55 were rejected under the judicially created doctrine of obviousness-type double patenting. Claims 1-10, 12, 14, 17, 19, and 21 were rejected under 35 U.S.C. § 102(e), and claims 15, 16, 20, and 22-55 were rejected under 35 U.S.C. § 103(a). The Examiner also objected to claims 11, 13, and 18 as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

DOUBLE PATENTING

In section 1 of the Office Action, the Examiner rejected claims 1-55 on the ground of obviousness-type double patenting. Applicants are filing herewith a terminal disclaimer in compliance with 37 C.F.R. § 1.321(c) to overcome this rejection.

CLAIM REJECTIONS UNDER 35 U.S.C. § 102(e)

In section 3 of the Office Action, the Examiner rejected claims 1-10, 12, 14, 17, 19, and 21 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,072,903 to Maki et al. ("Maki"). Applicants respectfully traverse.

Maki discloses an image processing system and method for head-tracking (following the movement of a head of a person), video compression capable of decreasing the data amount required for image communication by extracting the motion vector of the person in a teleconference, and three-dimensional pointing in a virtual reality system. Maki, col. 1, lines 11-18. A second embodiment of the system of Maki creates a surface model of the head of a person. Maki, col. 14, lines 52-53. This second embodiment includes a 3-D motion information extraction unit that determines the position and posture of the head of the person, and a distance information detector that detects information on the distance to the object and

reconstructs the shape according to the position and posture of the head. Maki, col. 15, lines 9-16; 49-51. A third embodiment of the system of Maki obtains images of an object using a video camera, analyzes the images for use in three-dimensional pointing, and acquires and tracks the posture of the object. Maki, col. 23, line 64 – col. 24, line 11. The system of Maki detects the position and posture of a person's head for the purposes of creating a model of the person's head or using the position and posture of the head as a three-dimensional pointer. Maki, col. 2, lines 47-59.

Amended claim 1 recites “a computer configured to determine a position and shape of an animal from video images and to characterize activity of said animal as one of a set of predetermined behaviors based on an analysis of changes in said position and said shape over time.” Maki does not teach or disclose a computer configured “to characterize activity of said animal” as recited in original claim 1, nor “to characterize activity of said animal as one of a set of predetermined behaviors” as recited in amended claim 1. There is no teaching or disclosure in Maki of using changes in the position and shape of an animal to characterize activity of an animal, much less characterize activity of an animal as one of a set of predetermined behaviors. The section of Maki cited by the Examiner (Col. 15, lines 49 – 57) describes the distance information detector which merely gathers distance information to use to reconstruct the object. Further, claim 2 of Maki (Col. 32, lines 56-67) referred to by the Examiner, which is dependent from claim 1 of Maki, recites additional information about the distance information detector for use in acquiring the shape of the object as set forth in the preamble of claim 1 of Maki. Thus, the shape of the object is not detected as stated by the Examiner, but rather it is what the system in Maki is trying to determine. The citation to col. 24 does not supply the missing elements and merely explains that feature points are used to track the object over a series of images.

Maki does not teach or disclose all of the limitations of amended claim 1. Applicants respectfully submit that claim 1 is not anticipated by Maki and is allowable. Claims 2-7 depend, directly or indirectly, from claim 1 and are therefore allowable for at least the same reasons.

Regarding claim 2 and its dependent claims, Maki does not disclose a “video digitization unit . . . for . . . converting said video images from analog to digital format.” The portion of Maki cited by the Examiner (Col. 8, lines 46-51) discloses a filtering processor as part of a feature extraction unit, which may be realized using a digital filter. A filtering processor that may be realized using a digital filter is not a “video digitization unit” as recited in claim 2. Maki does not teach or disclose all of the elements of claim 2. Applicants respectfully submit that claim 2 is not anticipated by Maki and is allowable.

Regarding claim 3 and its dependent claims, Maki does not disclose “an animal identification, segregation, and tracking module.” The portion of Maki cited by the Examiner (Col. 29, lines 23-28) discloses an image calculator to determine the luminance of the feature points on the object. Maki does not teach or disclose all of the limitations of claim 3. Applicants respectfully submit that claim 3 is not anticipated by Maki and is allowable.

Regarding claim 4 and its dependent claims, Maki does not disclose “a behavior identification module for characterizing activity of said animal.” The portion of the specification of Maki cited by the Examiner (Col. 23, lines 37-51) discloses that the three-dimensional position and posture of the object is determined using feature points. Claim 3 of Maki cited by the Examiner discloses a method of acquiring a shape of an object. Neither of these citations discloses the “behavior identification module” as recited in claim 4. Maki does not teach or disclose all of the limitations of claim 4. Applicants respectfully submit that claim 4 is not anticipated by Maki and is allowable.

Regarding claim 5, Maki does not disclose a “standard animal behavior storage module that stores information about known behavior of a predetermined standard animal.” Claim 4 of Maki cited by the Examiner discloses a method of estimating distance information on an object as part of the method of acquiring a shape of an object of claim 3 of Maki. The portion of the specification of Maki cited by the Examiner (Col. 7, lines 19-33) discloses a memory for storing time-series images; a series of moving pictures. Neither of these citations discloses a “standard animal behavior storage module that stores information about known behavior of a predetermined standard animal.” A series of moving pictures is not information about known behavior of a predetermined standard animal. Maki does not teach or disclose all of the limitations of claim 5. Applicants respectfully submit that claim 5 is not anticipated by Maki and is allowable.

Regarding claims 6 and 7, Maki does not disclose a “mouse” or a “rat.” The portion of Maki cited by the Examiner (Col. 2, lines 20-26) discloses a three-dimensional mouse enabling a pointing action in three-dimensional space by the operation of the buttons of the device, i.e., a *computer mouse*. Claims 6 and 7 limit the animal of claim 1 to a mouse and a rat, respectively. Claims 6 and 7 refer to a *biological mouse* and a *biological rat*, not computer pointing devices. Maki does not teach or disclose all of the limitations of claims 6 and 7. Applicants respectfully submit that claims 6 and 7 are not anticipated by Maki and are allowable.

Claim 8 recites “classifying said changes in position and shape of said animal as postures; and characterizing activity of said animal as one of a set of predetermined behaviors based on a comparison of a sequence of said postures to pre-trained models or rules of said set of predetermined behaviors.” As set forth above regarding claim 1, Maki does not

disclose characterizing activity of an animal as one of a set of predetermined behaviors.

Maki also does not disclose comparing a sequence of postures to pre-trained models or rules of a set of predetermined behaviors. The portion of Maki cited by the Examiner (Col. 27, lines 20-31) discloses a comparison section that generates synthesized images and evaluates postures according to the similarity of the generated images to the image of the object. In other words, Maki teaches comparing *images* to determine postures, not “comparing a sequence of postures to pre-trained models or rules of a set of predetermined behaviors” as recited in claim 8.

Maki does not teach or disclose all of the limitations of claim 8. Applicants respectfully submit that claim 8 is not anticipated by Maki and is allowable. Claims 9-55 depend, directly or indirectly, from claim 8 and are therefore allowable for at least the same reasons.

Regarding claim 9 and its dependent claims, Maki does not disclose “describing said sequence of said postures as behavior primitives and aggregating said behavior primitives as into actual behavior over a range of images.” The portion of the specification of Maki cited by the Examiner (Col. 22, line 56 – Col. 23, line 7) discloses determining a distance image by executing a certain evaluation function. Claim 1 of Maki cited by the Examiner discloses a method for acquiring the shape of a target object. Neither determining a distance image nor acquiring a shape of an object teach “describing said sequence of said postures as behavior primitives and aggregating said behavior primitives as into actual behavior over a range of images” as recited in claim 9. Maki does not teach or disclose all of the limitations of claim 9. Applicants respectfully submit that claim 9 is not anticipated by Maki and is allowable.

Regarding claim 10 and its dependent claims, Maki does not disclose “describing a set of conditions and rules required for characterizing said activity; and matching and testing

generated features to see if said conditions and rules are satisfied.” The portion of Maki cited by the Examiner (Col. 4, lines 18-27) discloses an estimation section for estimating information on the distance to a target object. An estimation section for estimating distance to a target object does not teach or disclose “describing a set of conditions and rules required for characterizing said activity; and matching and testing generated features to see if said conditions and rules are satisfied” as recited in claim 10. Maki does not teach or disclose all of the limitations of claim 10. Applicants respectfully submit that claim 10 is not anticipated by Maki and is allowable.

Regarding claim 12 and its dependent claims, Maki does not disclose classifying changes in position and shape of an animal as postures “using statistical and contour-based shape information.” The portion of Maki cited by the Examiner (Col. 9, lines 14-27) discloses extracting connected feature points by finding where contours in an image intersect each other. Extracting connected feature points from an image does not disclose classifying changes in position and shape of an animal as postures “using statistical and contour-based shape information” as recited in claim 12. Maki does not teach or disclose all of the elements of claim 12. Applicants respectfully submit that claim 12 is not anticipated by Maki and is allowable.

Regarding claim 14, Maki does not disclose classifying changes in position and shape of an animal as postures using “contour-based shape information selected from the group consisting of curvature measures, thickness measures, relative orientation measures, length measures, and corner points.” The portion of Maki cited by the Examiner (Col. 9, lines 14-23) discloses extracting connected feature points by finding where contours in an image intersect each other. Extracting connected feature points does not teach a way of classifying changes in position and shape of an animal as postures as recited in claim 14. Maki does not

teach or disclose all of the limitations of claim 14. Applicants respectfully submit that claim 14 is not anticipated by Maki and is allowable.

Regarding claim 17, Maki does not disclose “describing said sequence of said postures as behavior primitives [including] identifying patterns of postures over a sequence of images.” The portion of Maki cited by the Examiner (Col. 3, line 63 – Col. 4, line 17) discloses a decision section that decides the change of the position and posture of an object by correlating feature points from a series of images. Maki discloses determining changes in position and posture of an object over a series of images, but does not disclose the determining the changes in position and posture as describing a sequence of postures as behavior primitives. Maki does not disclose all of the limitations of claim 17. Applicants respectfully submit that claim 17 is not anticipated by Maki and is allowable.

Regarding claim 19, Maki does not disclose “analyzing temporal ordering of said behavior primitives.” The portion of Maki cited by the Examiner (Col. 8, lines 9-25) discloses extracting feature points from a series of images determining three-dimensional information at each feature point. Maki discloses a time-series of images, not “analyzing temporal ordering of said behavior primitives” as recited in claim 19. Maki does not teach or disclose all of the limitations of claim 19. Applicants respectfully submit that claim 19 is not anticipated by Maki and is allowable.

Regarding claim 21, Maki does not disclose a “set of predetermined behaviors [that] corresponds to a set of pre-trained behavior models.” The portion of Maki cited by the Examiner (Col. 7, lines 10-25) discloses an image processing apparatus for automatically creating a surface model of the head of a person. An *image* that is a model of a head of a person does not teach or disclose a pre-trained behavior model. Maki does not teach or

disclose all of the limitations of claim 21. Applicants respectfully submit that claim 21 is not anticipated by Maki and is allowable.

CLAIM REJECTIONS UNDER 35 U.S.C § 103 (a)

In section 4 of the Office Action, the Examiner rejected claims 15, 16, and 22-55 under 35 U.S.C. § 103(a) as being unpatentable over Maki in view of U.S. Patent No. 6,242,456 to Shuster et al. ("Shuster"). Applicants respectfully traverse.

As set forth above, Maki does not teach or disclose all of the limitations of claim 8, the independent claim from which claims 15, 16, and 22-55 depend. Thus, claims 15, 16, and 22-55 would be allowable even if the elements identified by the Examiner as not being in Maki were obvious in view of Shuster, and are allowable.

Further, there is no motivation to combine Maki and Shuster, and the Examiner has not pointed to any suggestion that one skilled in the art should combine them. Maki discloses an image processing system and method for head-tracking (following the movement of a head of a person), video compression capable of decreasing the data amount required for image communication by extracting the motion vector of the person in a teleconference, and three-dimensional pointing in a virtual reality system. Maki, col. 1, lines 11-18. Shuster discloses a method for treating a repetitive behavior disorder in animals by administering doses of one or more NMDA receptor antagonists. Shuster, col. 1, lines 56-61. These two references are directed to completely non-analogous arts. Applicants respectfully submit that neither Maki nor Shuster provide any possible motivation to combine the image processing system of Maki with the method of treating a disorder in animals with a certain type of drug of Shuster. It is of course impermissible hindsight reasoning to rely on the current application to find a motivation to combine.

Neither of the references, alone or in combination, teach or disclose all of the limitations of claims 15, 16, and 22-55. Further, there is no express or implied motivation to combine the references provided by the Examiner or found in the references. Applicants respectfully submit that claims 15, 16, and 22-55 are not obvious and allowable.

Regarding claims 16, 28, 33, 39 and 48, none of the references cited by the Examiner correspond to the claimed limitations.

The Examiner's grouping of claims 22-27 and 29-32 and 34-38 and 40-47 and 49-55 and rejecting them because analogous arguments apply does not enable Applicants to properly respond to the rejection and hence the rejection should be withdrawn. Quite clearly, none of the limitations of these claims are addressed by Maki, and Shuster fails to supply the teaching or suggestions that would render these claims obvious.

In section 5 of the Office Action, the Examiner rejected claim 20 under § 103(a) as being unpatentable over Maki in view of U.S. Patent No. 5,870,138 to Smith et al. ("Smith"). Applicants respectfully traverse.

As set forth above, Maki does not teach or disclose all of the limitations of claim 8, the independent claim from which claim 20 indirectly depends, and does not teach or disclose all of the limitations of the intervening claims. Thus, claim 20 is allowable.

Further, there is no motivation to combine Maki and Smith and the Examiner does not provide one. The portion of Smith cited by the Examiner (Col. 17, lines 41-55) discloses a device that analyzes output of a face changer to output the probability of input images belonging to a specified set of expressions, and that the device may be realized as a Hidden Markov Model. There is no suggestion or motivation in Maki to use a Hidden Markov Model to output the probability of input images belonging to a specified set of expressions in

Maki's system. Indeed, to do so would not appear to be possible and still use the algorithms and methods disclosed in Maki.

None of the cited references, alone or in combination, teach or disclose all of the limitations of claim 20. Further, there is no suggestion or motivation to combine the references. Applicants respectfully submit that claim 20 is not obvious and is allowable.

To the extent that the Examiner disagrees with Applicants that the cited sections of Maki do not disclose the claimed features it is requested that he explain how those sections relate at all to the claimed elements as opposed to merely making conclusory statements that they are the same.

ALLOWABLE SUBJECT MATTER

In section 6 of the Office Action, the Examiner objected to claims 11, 13, and 18 as being dependent upon a rejected base claim, but would be allowable is rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Applicants have amended claims 11, 13, and 18 to be in independent form, including all of the limitations of the base claims and any intervening claims. Claims 11, 13, and 18 are thus allowable.

CONCLUSION

Based on the foregoing amendments and remarks, Applicants respectfully submit that all pending claims in the present application are in condition for allowance and respectfully request the issuance of a Notice of Allowance. If a telephone conference would facilitate the prosecution of this application, the Examiner is invited to contact Applicants' attorney at the number listed below.

Respectfully submitted,

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